
VICTORIAN *ENTOMOLOGIST*

VOL. 43 No. 6

December 2013

Print Post Approved PP 349018/00058

Price: \$ 4.00



News Bulletin of The Entomological Society of Victoria Inc.

THE ENTOMOLOGICAL SOCIETY OF VICTORIA (Inc)

MEMBERSHIP

Any person with an interest in entomology shall be eligible for Ordinary membership. Members of the Society include professional, amateur and student entomologists, all of whom receive the Society's News Bulletin, the Victorian Entomologist.

OBJECTIVES

The aims of the Society are:

- (a) to stimulate the scientific study and discussion of all aspects of entomology,
- (b) to gather, disseminate and record knowledge of all identifiable Australian insect species,
- (c) to compile a comprehensive list of all Victorian insect species,
- (d) to bring together in a congenial but scientific atmosphere all persons interested in entomology.

MEETINGS

The Society's meetings are held at the 'Discovery Centre', Lower Ground Floor, Museum Victoria, Carlton Gardens, Melway reference Map 43 K5 at 8 p.m. on the third Tuesday of even months, with the exception of the December meeting which is held on the second Tuesday. Lectures by guest speakers or members are a feature of many meetings at which there is ample opportunity for informal discussion between members with similar interests. Forums are also conducted by members on their own particular interest so that others may participate in discussions.

SUBSCRIPTIONS

Ordinary Member	\$30 (overseas members \$32)
Country Member	\$26 (Over 100 km from GPO Melbourne)
Student Member	\$18
Electronic (only)	\$20
Associate Member	\$ 7 (No News Bulletin)
Institution	\$35 (overseas Institutions \$80)

Associate Members, resident at the same address as, and being immediate relatives of an ordinary Member, do not automatically receive the Society's publications but in all other respects rank as ordinary Members.

LIFE MEMBERS: P. Carwardine, R. Field, D. Holmes, T. New, K. Walker, D. Dobrosak.

Cover design by Alan Hyman.

Cover photo: *Coenagriou lyelli* (mating) taken at a swamp in Colquhoun State Forest (near Lakes Entrance) on 3rd December 2012. Photographer Reiner Richter.

**Minutes of the Entomological Society of Victoria General Meeting,
Tuesday 15th October, 2013. 19:45 at AgriBio, Bundoora**

Attendance: Linda Rogan, Margaret Endersby, Ian Endersby, Ross Field, Steve Williams, Patrick Honan, Maik Fiedel, Frank Pierce, Trevor Hausler, Kirsty-Lee McBean, Ray Besserdin
Apologies: Peter Carwardine, Peter Marriott, Peter Lillywhite, Grant Kuseff, Anh Phung, Jim Tuttle, Laura Quinn, Carol Page, Roch Desmier
Guests: John Wainer, Steven Evans

The evening promised to be a very busy evening so the society opted to forego the formalities until the next meeting.

Our meeting this evening was kindly hosted by Dr Mallik Malipatil, who is the Principal Research Scientist (Biosystematics) for the Invertebrate Taxonomy and Collections at DEPI AgriBio. Dr. Malipatil was assisted through the evening with the kind generosity of his team, Mark Blacket, Linda Semeraro and John Wainer.

We started the evening with presentations from the team and as part of the brand new facilities, a few facts and figures:

- DEPI and LaTrobe University joint venture, \$250 million
- Approx. 400 occupants [75% DEPI: 25% La Trobe, academics and students]
- Research and teaching collaborations
- Biosciences Research Division, plant & animal sciences, including plant health and animal health
- Taxonomy & diagnostics including collections, moved from Knoxfield in late March
- State of the art facilities, some labs and facilities have levels of quarantine compliance, NATA accreditation. For instance, some of the labs (and collections) are in QC2 and the highest level QC3 environments.



Figure 1 Main entrance to new AgriBio facility

Dr. Malipatil explained the different areas of the work performed at AgriBio. There was a wealth of information with the variety of work that is carried out; I have tried to summarise this within these minutes. AgriBio is involved in many activities:

- Identification and Diagnostic work; where they are involved in the identification and quarantine, DEPI research projects as well as diagnostic work via Crop Health Service
- Their taxonomy activities include the curation of Reference Collections; the validation and databasing of specimens.
- Taxonomic research and associated activities included diagnostic / identification resources (web-based resources) (Lucid) e.g. *Liriomyza* leafminers, Identification guides and keys.
- Diagnostic protocols for DEPI, Plant Health Australia, DAFF and CRC PBS, IPPC e.g., Citrus psyllids, *Dendroctonus* beetle groups, leafminers, phylloxera
- Digital image capture
- AgriBio also performs a role contributing to Import Risk Analysis, Contingency Plans for specific pests, import applications on bio-control agents



Figure 2 Inside AgriBio reception

Pest records and trade

AgriBio enables Australia to conform to the International Plant Protection Convention (IPPC), where countries must:

- Maintain accurate, verifiable (must be specimen-based records)
- Transparently share pest status information
- Report occurrence, outbreak and spread of pests
- Quarantine authorities must have access to records to meet IPPC standards

Dr. Malipatil was able to give us a case study: Karnal Bunt, a fungal disease exotic to Australia. The Pakistan Government reported it had found Karnal Bunt in a wheat shipment from Australia. A national survey of Karnal Bunt of wheat was conducted at DPI Knoxfield. Comparisons with preserved specimens in the reference collection revealed that the wheat contaminant was a bunt of a weedy grass common in Southern Australia. As a result, Australia's \$1 billion wheat crop could continue to be exported.

AgriBio holds the most comprehensive reference collection of plant and pest pathogens in Victoria. The reference collection data usually consists of multiple records and gives an indication of pest distribution, abundance, and occurrence over time and serves as the definitive record of plant pests and diseases in Victoria, i.e. basis for quarantine trade decisions

DEPI has a number of reference collections which serve the following purposes:

- Legal obligations (local and international) - Require verifiable records of pests and diseases present in Victoria

- Biosecurity - Surveillance (passive and active) Incursions
- Market access - Existing markets, Pest Risk Analysis (for which collections provide authoritative records); New markets, PRA
- Research / Education - Collection based research (taxonomic, ecological / IPM)
- Training Biosecurity Victoria and other DEPI staff, consultants, growers
- Biodiversity

These collections consist of:

Victorian Agricultural Invertebrate Collection - Pest species

- Beneficial species (including biocontrol agents of weeds and invertebrate pests)
- Agriculture ecosystems
- Incorporating specimens from: Forest Science Melb Uni (forestry); DEPI Frankston (biological control); DEPI regional centres Rutherglen, Tatura and Mildura; DEPI mosquito collection from Attwood (Arbovirus vectors of importance in Victoria, e.g., M V Encephalitis, Ross River virus)
- Had its origin around 1889 when Charles French Sr. was government entomologist 1889-1911
- Currently holds ca 200 000 specimens insects and arachnids
- Specimens pinned, mounted, alcohol preserved, slide mounted
- 75 000 databased, accessible via Australian Plant Pest Database

Plant Parasitic Nematode Collection

- Established in the 1950s
 - One of three nationally significant collections
 - Comprising about 10 000 slide mounted and 5000 unmounted specimens
 - Primarily plant parasitic groups, but also some free living species
- Most specimens databased, accessible via the Australian Plant Pest Database

Victorian Plant Disease Herbarium

- Founded in 1890 by Daniel McAlpine, the first Government appointed plant pathologist
- One of three herbaria that comprise the National Collection of Fungi
- Fungi, bacteria and viruses
- 35 000 preserved specimens
- 2 000 living cultures of fungi and bacteria
- Most specimens databased, accessible via the Australian Plant Pest Database

Animal Parasite Collection

Ectoparasites (insects, ticks, etc.) and endoparasites (nematodes, cestodes, trematodes) common in livestock and wildlife in Victoria

Comprising about 2500 alcohol bottles, including 500 from ex- Bairnsdale diagnostic laboratory

Animal pathogen collection

- 10 000 + glass microscope slides of endemic diseases seen in Victoria
- Some slides of exotic diseases from around the world that have been eradicated from Australia

Dr. Malipatil is keen to develop further collaboration with the society and suggested one area could be the assistance of the society or members in identification of the Charles French Coleoptera collection.

Mark Blacket gave us a presentation on the work that they do in the identification of Australian invertebrates. These are mainly insects but now branching out into other invertebrate species. Mark explained how they were involved in the morphological and molecular testing of species. They invariably do a lot of work on fruit flies where it is economically important to be able to accurately identify species. Some occur only in specific regions of Australia, west or east, for example. Mark went into some detail of DNA barcoding used in the identification of fruit fly adults and their larvae.

Mark also showed us some real examples of how they use DNA barcoding in the identification of Green Snails – whose young look identical to common garden snails. Identification of immature life-stages of leaf miners is also done using this process (Polymerase chain reaction (PCR)).

Linda Semeraro then demonstrated the new database system - KE Mu, which is the same as used by the Museum, that contains 4 different databases making up the whole system – these are made up of the main database for pinned specimens, slides and alcohol; tissue collection material (molecular specimens), image library and reprints database.

DEPI Collections contribute to Australian Plant Pest Database (APPD), which is a national, online database of pests and diseases of Australia's economically important plants, and provides an



Figure 3 Above L John Wainer demonstrating his lab

Figure 4 Above R Mark Blacket demonstrating the imaging equipment



Figure 5 The Tour: from left to right: Dr Mallik Malipatil, Kirsty-Lee McBean, Ross Field (obscured), Steven Evans, Margaret Endersby, Ray Besserdin (obscured), Ian Endersby, Steve Williams, Trevor Hausler

information system that enables rapid location of voucher specimens and efficient retrieval of detailed data. In the near future APPD data will be accessible via Atlas of Living Australia.

We then left the presentation room to don our lovely crisp new lab coats for a wonderful tour of the facility. We had a wonderful tour of the facility and the different sections. We were lucky to have John Wainer on hand to give us some great insights into how they process soil samples for nematodes.

We were lucky to have Ross Field with the group as he was able to tell us a little about the design and development of the building, which took years of planning. Amongst the many fascinating areas, is the morgue, which can accommodate a full-sized horse and dissolve it within a few days. Ross also explained how the different quadrants butterfly into each other. Well, they would, wouldn't they Ross!

Followed by tea, biscuits, cheese and some very tasty cakes!

An exceptional host, facility and evening, enjoyed by everyone. Thank you.

Meeting finished at 22:40

**Minutes of Entomological Society of Victoria Council Meeting
Tuesday, 26 November 2013 Melbourne Museum**

Attendance: S Curle, P Honan, P Carwardine, I Endersby, L Rogan, P Marriott.

Apologies: K Walker, P Lillywhite, D Dobrosak, M Fiedel, J Grubb.

1. Previous minutes

Minutes of the previous council meeting [Vic. Ent. 43(5): 96-97] accepted M: P. Carwardine S: L. Rogan

2. Correspondence

We have received correspondence from:

- Eliza Maher – thanks for Science Talent Quest Bursary
- Sasha Dean – Call for nominations for Victoria Young Achiever awards
- Fay Diffin: henipaviruses (Hendra, Nipah) article. The council reviewed the article and did not believe it would be an article of interest to members of the society. It was therefore not deemed suitable for publication within our bulletin.
- Melissa Townsend; News.com.au – spider identification
- Community Internet Services Announcement
Notification that the free hosting that we have been able to utilise from the State Library of Victoria is coming to an end. We need to investigate alternative hosting solutions for the society's website. A: S. Curle
- Renuka Zade - OMICS Group offer to develop *Victorian Entomologist* as an international journal, deemed not appropriate
- The society has been mentioned on the radio recently; mentioned in a program on 3AW - Emperor Gum caterpillars; and on RRR
- Charlie Hope of Wild Dog Books seeking a fact-checker for a children's book on butterflies.

3. Treasurer's Report:

Account Balances-

General a/c: \$ 5,877

Le Souef a/c: \$5,634

Publishing a/c: \$ 17,457

Members: 111 Unfinancial Members: 0

New membership application being completed for Mackenzie Kwak of Panton Hill

Bank signatories: we do not currently have Patrick set up as the second signatory for the society (as per the constitution).

A: P. Honan to organise after receiving the relevant information from I. Endersby.

4. Editor's report:

- We currently have sufficient material for the next bulletin.
- Both book reviews have been completed.
- Agreement reached for next year's cover image.

General Business

5. Future meetings:

- Dr. Steinbauer has offered to speak at the February 2014 meeting.
- December Excursion: Saturday December 7th; Jells Park. Further email reminder to be sent out.

6. Newsletter: progressing.

7. Publications: MOV5 and MOV2 2nd edition is expected to be ready for the 1st half of 2014.

8. Insurance for excursions; Strategies for Managing Liabilities

Further discussions are ongoing with regards to insurance cover and liability for the society. I. Endersby has previously circulated options following legal discussions and these will be reviewed further at the extraordinary council meeting to be held in January 2014. The Excursion and Safety Guide to also be reviewed.

9. Overseas membership and Subscription rates. Further review required in the New Year.

Meeting closed at 20:00.

Future Meetings:

Council meetings 2014: Jan. 21st, Mar. 18th, May 20th, Jul. 15th, Sep. 16th, Nov. 18th.

2013:

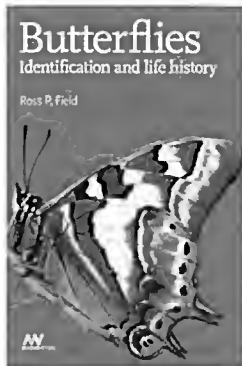
December	Saturday 7th	Excursion	Members' excursion	An evening at Jells Park
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2014:

February	18th	General Meeting	Two new species of native psyllid - Dr Martin J. Steinbauer F.R.E.S	
April	15th	AGM	Butterflies and the new book	Ross Fields
June	17th		Members' presentations	
August	19th		Lord Howe Island Stick Insect	Rohan Cleave
October	21st		Members' presentations	
December	TBC		Excursion	

Correction: Page 111 of Vic Ent 43(5) August 2013 change

"great white cabbage butterfly, *Pieris brassicae*," to 'cabbage white butterfly, *Pieris rapae*'.



Butterflies Identification and Life History

Ross P. Field. Published by Museum Victoria 2013. pp. 324.

ISBN: 9781921833090 (paperback version, \$29.95). (ebook version available, \$19.95)

This is a very affordable must-have Field Guide for all Australian butterfly enthusiasts, whether amateur or professional. The book is packed with exquisite colour photographs of every butterfly that has been recorded in Victoria to date, and includes the colour documentation of the early stages of butterfly morphology from ova to imago with both set adult specimens and live images of larvae, pupae (with attendant ants where relevant) and the adults in their natural resting positions. In many cases the early stages

are documented for the first time, together with larval food plant habitat photos. These features are not found in other field guides or texts on Australian butterflies. The guide has over 1,000 images, covering 130 species, enabling virtually all stages of every Victorian butterfly to be readily identified.

Having said that, there are at least three important features of this publication that have been particularly well thought-out and set it apart as a very user-friendly Field Guide:

Firstly, the format is consistently presented with the colour plates adorning the right hand page and the diagnostic / descriptive notes on the left. This makes it very easy to find whatever you are looking for in predictable fashion throughout the book. The descriptive notes cover both sexes of the adults and also a description of the early stages. Then there are notes on the larval food plants, specific biological characteristics, habit and distribution in Victoria (and beyond).

Secondly, the descriptive notes are backed-up with some very innovative maps and adult flight charts. The maps distinguish the recorded distributions in Victoria pre and post 1970, as being the marker of increased interest in species conservation in the State. The flight charts show the percentage of adults recorded in a given month. These two features combine to greatly assist the field worker to expect the 'where and when' for each species and also to search in areas to extend their known distribution.

Thirdly, there is a very useful checklist of the Victorian butterflies with colour-coded identification on conservation status and their occurrence in other states. This complements the chapter on 'Conservation and butterflies as flagship species' where State and Federal conservation status has been applied to some species.

Other notable features of this book include the colour-coded tabs which guide the user through the butterfly families, a glossary of technical terms used in the book, and the use of both scientific and common names throughout, with a chapter dedicated to classification and nomenclature.

However, it is not immediately apparent that the scope of this book is focussed only on the Victorian butterfly fauna, even though the distribution on many of these species extends into the other states.

Finally, the author is eminently qualified for this work through his career as an entomologist in the Victorian Public Service where he worked on the biological control of weeds and invertebrates and has also published widely on his passion for insect ecology. He has obviously spent many years documenting the life histories of the Victorian butterfly fauna and has excelled himself with this Field Guide.

Additional Distribution Records for Victorian Dragonflies (Insecta: Odonata) Continued

IAN ENDERSBY

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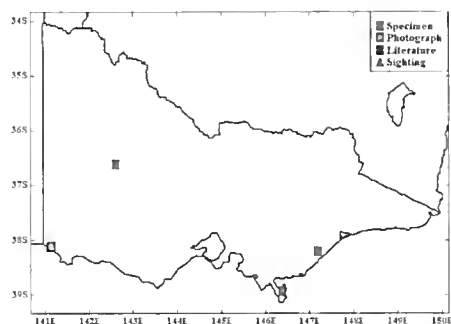


Fig. 19 Distribution of *Austrothermus nigrescens*

Austrothermus nigrescens (figs 19-24)

In Australia this species is sparsely distributed below latitude 27°S with specimens known from WA, SA, QLD, NSW, Tas and three from Victoria. The new locality where Figs. 20-24 were taken is geographically closer to the Rapunyp specimen than the closest known specimens in South Australia which are both from Kangaroo Island. The broadened abdomen, best seen in Fig. 21 is a good diagnostic. Comparison of the anal appendages



Fig. 20 *A. nigrescens* Long Swamp Photo R. Richter



Fig. 21 *A. nigrescens* Long Swamp Photo R. Richter



Fig. 22 *A. nigrescens* (♀) Long Swamp Photo R. Richter

seen in Fig. 22 (♀) and Fig. 24 (♂) distinguishes the sexes. Normally the male of this species is a much redder colour so, perhaps, this individual has recently emerged. The wings forward posture seen in most of these photographs occurs often in those members of the Libellulidae which perch. It is thought to be a temperature control mechanism rather than a preparedness for flight. Some argue that it shields the abdomen from heat while others say that it provides a sheltered warm environment against the cold. These photographs were taken in full sunlight giving some credence to the former explanation.



Fig. 23 *A. nigrescens* Long Swamp Photo R. Richter



Fig. 24 *A. nigrescens* (♂) Long Swamp Photo R. Richter

Coenagrion lyelli (Figs 25-30)

As well as the Victorian distribution shown in Fig. 25 the species is known from Tasmania, a cluster in southeast NSW and a disjunct grouping in north-eastern NSW and adjoining QLD. Originally collected at Gisborne and Bacchus Marsh, the specimens at Cape Otway and Wilsons Promontory suggest a Tasmanian connection as the species is well represented by specimens from the east

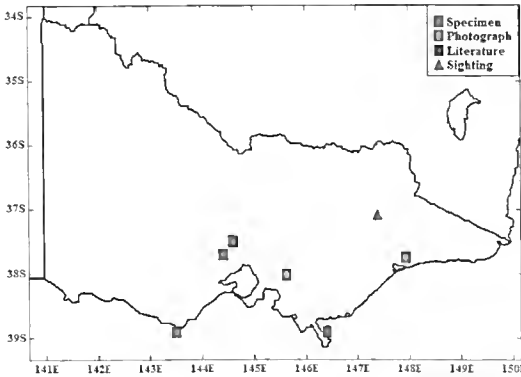


Fig. 25 Distribution of *Coenagrion lyelli*



Fig. 26 *C. lyelli* Bunyip Photo R. Richter



Fig. 27 *C. lyelli* Colquhoun Photo R. Richter

of that state, but that is probably an artefact of sampling. The new information extends the known range in the general direction of the southeastern NSW populations and adds another coastal locality. Morphologically it is closest to *Ischnura heterosticta* but the amount of blue on the male abdomen and the post-ocular linear pattern rather than spots makes the distinction easy. Fig. 30 gives a good view of the male secondary genitalia on abdominal segment 2. The duller colouration of the female (often to be found in Odonata) and can be seen in the mating pair of Fig. 28 and in Fig. 29.

Fig. 28 *C. lyelli* Colquhoun
Photo R. Richter

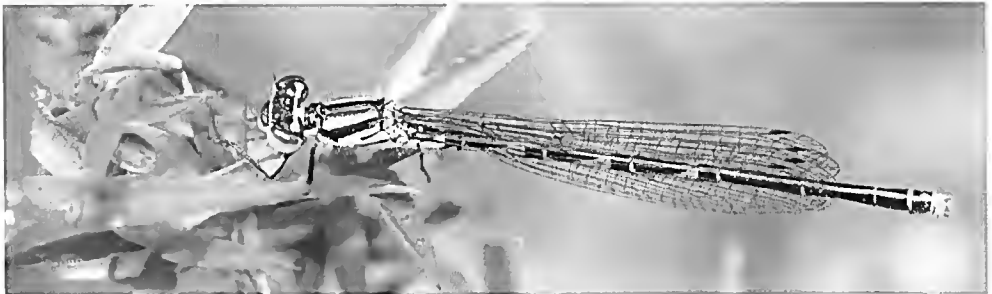


Fig. 29 *C. lyelli* (♀) Bunyip Photo R. Richter

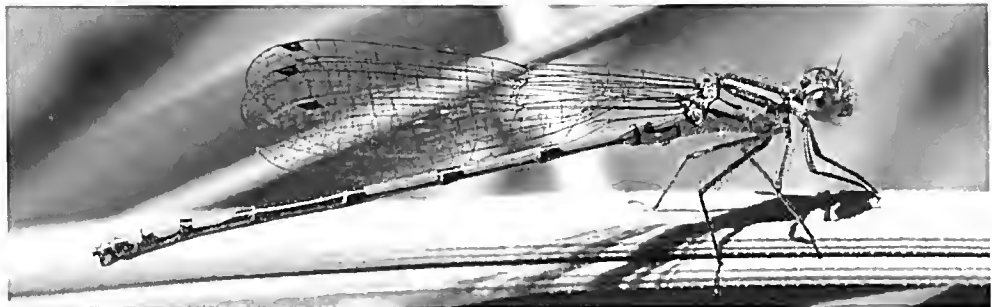


Fig. 30 *C. lyelli* (♂) Bunyip Photo R. Richter

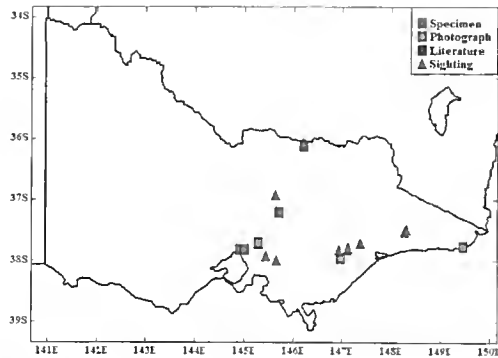


Fig. 31 Distribution of *Cordulephya pygmaea*

Cordulephya pygmaea (Figs 31-36)

This is the only dragonfly (Odonata: Anisoptera) genus to be found in Victoria which perches with its wings along its body like a typical damselfly (Odonata: Zygoptera). It is not uncommon but only five museum specimens were known when the 2010 maps were prepared. Since then a larva has been found in the Ovens River. Richter (2013) reports a second species of *Cordulephya* from the Wigan River. Distinguishing between larvae of the two species of *Cordulephya* requires a high magnification examination of the labial

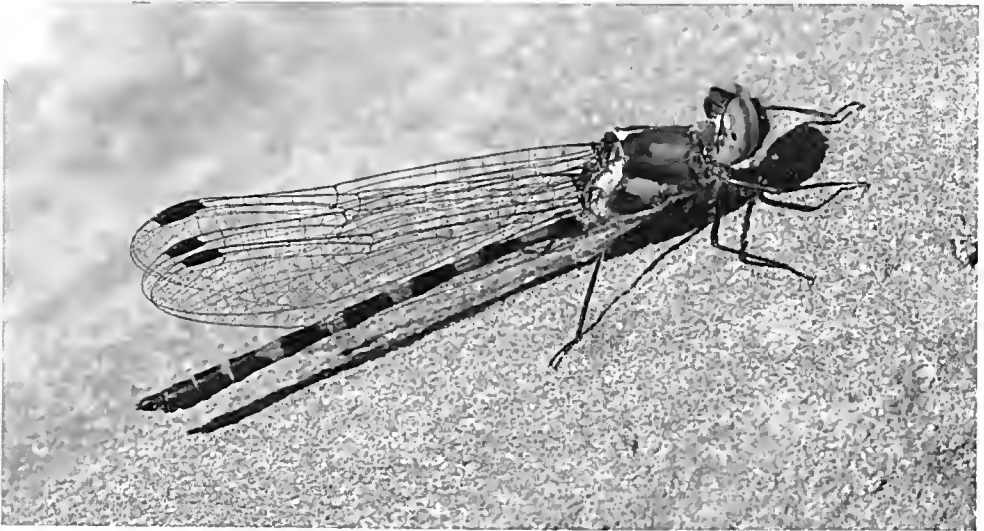


Fig. 32 *C. pygmaea* Macalister River Photo Duncan Fraser



Fig. 33 *C. pygmaea*
Elusive Lake
Photo Geoff
Walker

Apologies to Geoff as he was mistakenly listed in the Acknowledgements VE 43 no.5 p.99 as Geoff Williams instead of Geoff Walker.

palps but it is most likely that the Ovens River record is *C. pygmaea*. New localities in the Yarra River and in central Gippsland extend the confirmed distribution of this species. It flies later in the season than most other dragonflies.



Fig. 34 *C. pygmaea* Kangaroo Ground Photo Frank Pierce



Fig. 35 *C. pygmaea* Snowy River Photo Reiner Richter



Fig. 36 *C. pygmaea* Elusive Lake Photo Reiner Richter

Observations on Carrying Pair Behaviour among Asia-Pacific Butterflies (and Moths): Part V – Field diary extracts continued

Kelvyn L Dunn - email: kelvyn_dunn@yahoo.com

Summary: This paper presents nineteen observations of mating couples, involving eleven species of butterfly and moth from the Asia-Pacific region, compiled since 2008 and not reported previously. Observed mating behaviours match with other reports and similarly illustrate those various protective strategies that can be utilised when couples are disturbed or threatened at a time when they are effectively less mobile and so are more vulnerable to predation. Carrier details, mating times, habitat descriptions and relevant biological notes are included for each.

Introduction

Compelling evidence of a knowledge gap concerning the preferred sex which takes on the role of carrier in nuptial flights in butterflies, in the Asia-Pacific region, had driven four earlier field studies (Dunn 2000, 2005, 2009, & 2011). This fifth collation adds 19 more encounters for 11 species from six families, and of these, the carrier partner details for five species are determined for the first time (in this series of reports). Together, the new and supplementary information add to and strengthen the baseline data of 141 observations of 64 species reported previously (see Dunn 2011). I compiled these new encounter-events ad hoc and opportunistically (rather than by a structured data-gathering approach) as part of general butterfly observations and surveys throughout the region. The observations selected for inclusion in this fifth part are all from within the Australian states of Victoria, Queensland and Western Australia, and include two noteworthy contributions described from photos or photo-sequences as proffered by other observers.

Over four decades ago, Miller and Clench (1968: 130) remarked concerning the matter of encounter-frequency (and in doing so offered an insightful slant) that, *“Despite the rarity of mated pairs in the field, it is remarkable how many of the ... records consist of two or more pairs seen on the same day, even the same hour. This may be additional indication that appropriate weather conditions are important”*. As this statement is double-barrelled, I will discuss each component separately in light of my own experiential knowledge amassed over many years.

Firstly, adult butterflies can be variably conspicuous when they engage in certain routine and daily activities. These activities may include courting, perching, basking, roosting, egg laying and foraging, at which times they are usually agile and rely on sensory vigilance to evade predators. Mating, however, is an activity where both participants would seem more vulnerable to predators, particularly during conjugal flights, as these are often laboured and more direct (except perhaps for those groups that may need to feed during lengthy coitus – see Dunn 2005, 2009), and so poses particular risk for species that are without warning colouration to deter predators. Given a measure of defencelessness at such times, it is presupposed then that conjugal couples would engage in concealment whenever possible, and on that argument, their encounter rate in the field would be lower than the activity's actual frequency. Obviously, mating occurs regularly at certain times (albeit usually unseen for the most part, as argued) as that reproductive challenge itself drives male territoriality across the adult life span (an activity that seemingly occupies much of the male butterfly's time). For that reason, mating is unlikely to be an infrequent event in the life of an individual butterfly (contrary to the historic suggestion) as some females will mate more than once, but it is less common than courtship encounters, many of which prove unsuccessful. It is the case too, that certain conditions and circumstances when met may increase the chance of a successful courtship, both spatially and temporally. Hence, in my field experience, encounters with mating butterflies seemingly occur in 'fits and starts' and so present spasmodically rather than randomly, regularly or uniformly. Undoubtedly, others would have noticed this as well.

Secondly, the fact that multiple couples may be present and found in quick succession during a short visit to a particular site (with none seen at another nearby) is interesting and corroborates with my

own field experience. This phenomenon seems easily explained by aspects of microhabitat and seasonality. However, I cannot deduce any correlations with weather conditions at the time of each event from eyeballing the data accumulated (as presented in this and previous parts), instead it seems that any suitable climatic conditions that will enable flight activity that may lead to this. Indeed, advanced courtships (with tactile inspection) will occur even in what would seem unsuitable weather for adult activity. For example, I recently saw one satyrine (*Heteronympha penelope*), an inhabitant of the wetter montane areas and alpine regions in southeastern Australia (where cool conditions are common place during the warmer months) actively patrolling under heavily overcast weather (including during periods of drizzle), and attempting mating at that time, albeit ambient temperatures were warm (mid 20s), easing such activity. Regular shivering, during perching and basking in shadowless sunlight, at about 800m elevation in the Australian Alps, evidently helped sustain initial uplifts and prolonged flights, which were rapid (normal speed) and seemed unlaboured.

At odds, then, with the pioneering speculation concerning specific weather conditions as being unusually important, the evidence suggests that it is at certain sites and at certain times of the year (often species dependent in groups prone to seasonality or in those reliant on prolonged rainfall in the seasonally wet-dry tropics) that mating behaviour suddenly increases in frequency. In particular, it is at selected encounter sites, such as landforms and foraging areas (where males routinely patrol or perch, awaiting receptive females) and in breeding areas – those places of oviposition (where second matings in older females may occur), and at places of emergence (where unmated females are available) – that adults engaged in this activity will be more likely found. Searching at an appropriate time of the year, near larval food plants where soon-to-emerge pupae are present – especially for those species where emergence is synchronised (e.g. *Delias*), or for those that are attracted to pupae (e.g. *Cethosia*) and mate upon or very soon after emergence (e.g. *Jalmenus*) – will especially increase the chance of encountering one or more couples. This has been my experience, but that said, that does not mean that finding couples becomes a certainty at such times or places – it is just more likely – recalling too, that most couples remain camouflaged at rest and for that reason are easily missed, unless startled into flight.

Reports of encounters of multiple mating couples in close proximity exist for a number of butterfly species within the Asia-Pacific region; *Belenois java* (Pieridae) and *Acraca andromachus* (Nymphalidae) (see Alcock 1996) are prominent examples that spring to mind. The Castniidae is another group of diurnal Lepidoptera that may behave similarly, and in which synchronised mating (near host plants where newly emerged females are present) can occur in one or more Sun Moth species; Braby (2011) provided evidence for *Synemon phaeoptila*. All of these genera appear to share the common factor of synchronised emergences – a strategy that makes unmated females available in a short period and so increases that encounter-probability. I have found this situation occurs more often among various subfamilies of the Nymphalidae compared with other groups studied. Similar encounters in my series of reports can be found for seven species, namely, *Heteronympha merope* (Dunn 2000, 2005), *Hypolimnas bolina* (Dunn 2005), *Danaus petilia* (Dunn 2000, 2005), *D. affinis* (Dunn 2000, 2009), *Euploea tulliolus* (Dunn 2005), *Zizina otis* (Dunn 2005) and *Jalmenus evagoras* (Dunn 2011). The last-named species is one example, and a remarkable one at that, where this event seems the norm at breeding sites! The Imperial Hairstreak is usually localised in occurrence, often prolific in numbers and copulates at sites of oviposition and emergence (Dunn 2011) – routinely mating on the foliage of the larval host plants, amidst an abundance of the aggressive ants that vigilantly attend and guard the larvae. Improving the baseline inventory for these events, this fifth part includes additional examples for three species of butterfly (*B. java*, *D. petilia* and *D. affinis*) and a diurnal Arctiid moth, where more than one mating couple was in close proximity and found within a short sampling timeframe.

As with previous parts, times of encounter across the region have been aligned by conversion of all Daylight Saving Times (DST), which are used seasonally in some Australian states (or parts thereof), to the local Standard Time equivalents. The debatable usefulness of the times of encounters has been discussed previously (Dunn 2000, 2011) and is not discussed further. I refer to myself as ‘the observer’ in the species accounts so as not to detract from the subject (the study animals and their be-

haviour).

Regional abbreviations are as follows: Qld. (Queensland), Vic. (Victoria) and WA (Western Australia). Time zones referred to are AEST (Australian Eastern Standard Time) and AWST (Australian Western Standard Time). Other abbreviations consist of CP (Carrying Partner), M (Male), F (Female), WSF (Wet Season Form), DSF (Dry Season Form), V (Video/photographic images recorded) and KLDC (Vouchers in author's collection). I include coordinates where obtained by GPS.

Inventory: Mating observations

Arctiidae

Nyctemera amicus (White) – 1km NE by E of Beaconsfield Vic., Australia. [38°02.4'S, 145°22.7'E, 78m asl.] 12 Jan 2008. First pair: CP=F (1 flight), 0950h AEST. Second pair: CP=F (2 flights), 1200h AEST. Habitat: residential garden. Weather: sunny, 18°C & 24°C (for 1st & 2nd pairs, respectively).

First Pair: inadvertently disturbed from a sunlit metal fence post, a mating couple fluttered obliquely downwards, traversing 30cm horizontally and about 1m vertically, to land exposed on shaded level ground (at odds with seeking a secreted location – a strategic part of escape and camouflage) Both adults were more or less fresh conditioned, and the female, recognisable by her slender antennae, had carried. Upon settling, she held wings outstretched in anhedral angular position (meaning an obtuse-angled or inverted V-shape), typically assumed by settled day-moths. Still in copulation, male kept wings moderately opened in dihedral angle (acute 'V-shape') before flattening them to adopt anhedral angle. Couple seemed reluctant to uplift from the ground (or was unable to do so) and separated immediately (the ultimate strategic response linked to escape) when startled by physical contact. Both sexes then departed by flight (almost synchronously, meaning within a second of each other, and without obvious female reluctance); each rose to about 2m in height, and each settled on nearby foliage in anhedral angular pose. Early cessation of copulation has been noted previously in various butterfly genera, including *Pelopidas*, *Euploea*, *Arhopala*, *Leptotes* (Dunn 2005), *Zizina* (Dunn 2005, 2011) and *Hypoclinysops* (Dunn 2011) and is an important survival strategy in butterflies and moths which comes into play when alarmed by an intruder or a perceived threat.

Second pair: encountered about 2 hours later (at 1200h), and only 10m away from the discovery site of first conjugal pair. Female was positioned uppermost, and unlike her male which was in good-to-fresh condition, she was somewhat worn. Both sexes grasped the vertical substrate (verandah skirting) during copulation, and the male's wings overlapped atop of the female's wings, thereby seemingly constraining her departure. Nonetheless, the female flew when an antenna was gently probed with a twig, carrying her male in process. She landed uppermost about 1.5m above ground on nearby foliage. The carrier was now vigilant, and the observer's approach alone (without further tactile contact) provoked a second but short flight. Couple then settled, with female uppermost again, on a vertical wooden fence (at this point, observations were ceased).

N. amicus (occidental form) – 2km south of Leeman WA, Australia. 13 Nov 2008, 1000h AWST (1100h local WA DST). CP=undetermined (1 flight). Habitat: heath-land dunes. Weather: sunny & breezy. Observer's approach caused couple to fly up unexpectedly from where it had earlier settled and where it had remained unseen until that encounter. Couple then separated during flight. In-flight separation (as opposed to terrestrial separations) has been seen in *Ogyris* (Lycaenidae) (pers. obs) and this option to reduce vulnerability may be a widely utilised escape strategy (or may have occurred because mating was near completion or completed).

Noctuidae: Agaristinae

Eutrichopidia latinus (Don.) – 1.5km ENE of Warnet Vic., Australia. 17 Nov 2010, 0955h AEST [1055h DST]. CP=F (4 flights). Habitat: heath-woodland adjacent mangrove estuary. Weather: sunny, about 17°C.

Couple inadvertently disturbed from roost site on sunlit bracken; it flew several metres, about 1m above ground, with male suspended from female abdomen. Couple then landed on foliage of bracken (the dominant understorey), at similar height. Both partners were in fresh condition: the larger adult (female) consistently settled uppermost and the smaller adult (male), which was not grasping substrate, remained suspended, head downwards. Uppermost adult (female), when settled, held wings outstretched in anhedral angular position (inverted V-shape). The suspended adult (male) briefly held wings opened in dihedral angle (acute V-shape) before adopting the anhedral position of the carrier. Flights varied in height from 1-2m above ground and ranged from 2-3m initially, and extended about 10m on the fourth flight – the lengthier latter flight seemed linked to an escape strategy. On each occasion, the couple avoided high or very low foliage but roosted on shrubbery at 1.0-1.5m height. On the third flight the couple flew in an arc (rather than a direct line), covering 4-5m, and in process returned to land 1-2m from the previous roost site. Couple was not particularly wary but flew when approached very closely (within 5-10cm) by a probe. To confirm the sexes (which are very similar in wing patterns and difficult to distinguish when their abdomens are partly obscured by their reversed wings) the couple was gently netted. The larger adult's wings were then marked at the apex by removal of scales, and that marked adult was confirmed as the carrier in captivity. In containment, the couple would align suitably by walking and rotating to ensure the larger adult (female) was uppermost. Copulation was unimpeded by the process of netting, undisturbed by brief handling (which involved marking the female) and unaffected by subsequent containment in the dark (to prevent undue activity and distress) as they were still mating 15 minutes later when inspected again (1010h). However, when next inspected at 1115h (1 hour & 20 minutes after initial encounter) they had separated. Subsequent examination of the larger adult, marked as the consistent carrier to ensure its recognition later, confirmed its sex as female (KLDC).

Hesperiidae

Dispar compacta – Arthurs Seat, near lookout tower, at summit picnic ground, Vic., Australia. 19 Mar 2011, 1130h AEST. CP=F (8 flights). Habitat: grassy woodland. Weather: sunny, 19°C. Couple first encountered settled (about 1m above ground) on a dry seed head of grass in sunshine. Female (in fresh condition) was uppermost, her wings held closed. Male (with moderate wing wear) held wings in V-shape and grasped substrate (V). Female carried consistently, usually maintaining a height of about 1m above ground, and landed on grass blades and stems. Flights ranged from short relocations of just several centimetres to a position on the same stem or on an adjacent grass blade to lengthier trans-locations that varied from 1-5m from the previous resting site. Couple was easily approached and seemed unwary – when observer's forefinger made contact with the legs of the carrier, it slowly walked on to it, and without any indication of alarm (such as a rapid departure, an attempt at retreat or secretiveness, or separation of the adults).

Oreisplanus perornatus – southwest of Spargo Creek, Vic., Australia. 28 Nov 2011. G. Walker. CP=prob. F (based on alignment, no flights observed). Habitat: heathland. Mating took place on dry stem near sedges; both adults in fresh condition; female uppermost (and by inference, the likely carrier of the couple).

Papilionidae

Papilio demoleus – 25km NNE Charleville, Qld, Australia. [26°12.7'S, 146°20.1'E, 320m asl.] 30 Sep 2012, 1140h AEST, CP=F (10 flights). Habitat: native pine woodland with roadside flowering herbs. Weather: sunny & breezy. Couple was found mating (about 30cm above ground) on stems of dry Mitchell grass growing beyond road shoulder. It was reluctant to fly initially, but with prompting female subsequently carried male, at heights of 1.0-1.5 metres above ground, for nine short flights of 1-2m each time. Couple chose to settle, on most occasions, about 1m above ground on grass stems in full sun. The final flight observed was lengthy (and likely to facilitate escape); it occurred after repeated disturbance, and extended for some 50m.

To be continued.

Peter Marriott, recipient of the Le Souef Memorial Award for 2013

Marilyn Hewish

Peter Marriott has received the 2013 Le Souef Award for contributions to Australian entomology by an amateur. As author of the *Moths of Victoria* series and a volunteer in the Melbourne Museum, he has had a fundamental impact on entomology in Victoria.

In 2000, while working as a museum volunteer, Peter conceived the idea of a field guide covering every Victorian moth species. This had never before been attempted. Peter envisaged a series of about 15 books. *Moths of Victoria* parts 1-4 have been published, covering 13 families and more than 600 species. Other volumes are in preparation. The books and subsequent updates act as current state checklists. Since the first book, Peter has formed and led a project team by recruiting editors and other authors.

A revolution occurs in any branch of natural history when the first complete field guide is published. Peter's unique approach has

made his books accessible, attractive and usable in the field for amateur naturalists, photographers, students and the wider community. Thus the books are small, affordable and have colour illustrations of living moths and pinned specimens. Completeness and scientific accuracy have not been compromised. Additional information is on an accompanying CD.

Peter's work at the museum is equally important. He became a volunteer in the Entomology Dept in 1996 and has been systematically working through the museum's moth collection. To date, he has rehoused, sorted, identified and catalogued label information in the museum's on-line EMu database for over 31,000 moth specimens. He works independently on the priceless state reference collection and integrates privately donated collections. Peter's work is characterised by care, commitment and scientific thoroughness. In his research, he keeps track of the literature from current papers back to species descriptions from the 1800s, he examines type specimens and he visits the Australian National Insect Collection (ANIC) in Canberra. Thus he is transforming the Melbourne Museum's moth collection into an instrument suited to modern Lepidoptera studies.

Under Peter's leadership, there has been an explosion of knowledge on moths in Victoria. His books provide the baseline. Peter receives many requests for help with moth identification. Encouraging these contacts, he has built a network of enthusiasts and he now collates records from all over the state. Moth species new to science, new records for Victoria and large extensions in known range are often found. These new enthusiasts see Peter as their mentor.



Peter Marriott setting up a light trap at Brisbane Ranges, November 2008. Photo by Marilyn Hewish.

Since the first book appeared, public awareness of moths and insects in general has spread. In moth talks and demonstrations in urban and country Victoria, Peter uses his skills as a Scout leader and former school teacher to engage adults and children. These talks are not just about moths. They range into broad discussions about the environment, conservation and the importance of insects in the natural world and for human well-being.

Peter has a photographic library of 1800 images of living moths; 1400 are his own and others are from his network of correspondents. Several published checklists and revisions of Australian moth families feature Peter's generously donated specimens and photographs. Some of his specimens have been designated as holotypes and paratypes. Peter has also led Lepidoptera teams in major museum surveys in the Bush Blitz and Bioscan programmes. Perhaps the greatest honour conferred on him is the naming of a new moth species, *Zygaenidae Pollanthis marriotti* Kallies & Mollet, 2011. This demonstrates how he is respected by his peers.

Peter joined the Entomological Society of Victoria in 2002, was Vice-president in 2003 and President from 2004 to 2013. He has been a fine ambassador for the society and worked selflessly in promoting its aims for the wider appreciation, knowledge and conservation of the insect world. As a Council member, he continues to make a valuable contribution.

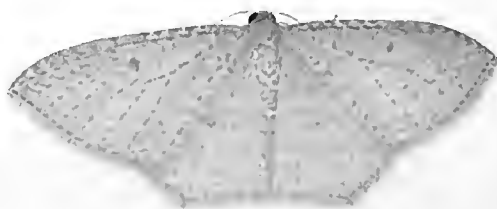
Peter has become the public face of moth study in Victoria. In scientific terms, he is compiling current knowledge on Victorian moths and laying the ground-work for further studies. His work has been of great value to the museum and its curatorial staff. Equally important is his contribution to community education and public awareness. Beyond this state's borders, he has helped to revise identifications in the ANIC and he corresponds with lepidopterists in other states and overseas. Visiting researchers benefit from Peter's reorganisation of the Melbourne collection and the museum's on-line EMu database is consulted world-wide.

The Society's Council and members congratulate Peter on receiving this richly deserved award. His major entomology projects are long-term commitments. We wish him well for his work in the future.

Observations

Poecilasthena pulchraria by Cathy Powers.

I live on the eastern slopes of the Brisbane Ranges (Victoria) and, thanks to Marilyn Hewish, have discovered an interest in moths. So far, I have photographed over 300 species (those that I can identify) without leaving my property. Sometimes strange moths arrive and it takes a bit of investigation to discover their identification and then there are those images that sit in my computer file titled 'Absolutely No Idea'.



Poecilasthena pulchraria golden colour form
Photo Cathy Power

In mid-July 2013, I had the pleasure of photographing a *Poecilasthena pulchraria* but unlike the others I have seen before (bluish), this was an amazing golden colour. After contacting Peter Marriott and having him confirm my ID, I also had a look at the images on the CD for the Moths of Victoria part 3. In the PDF page about the *P. pulchraria*, there are images of the different colour forms but I thought I would share mine with you.

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Thanks to Daniel Dobrosak, Marilyn Hewish and Ian Endersby for assistance in producing the Victorian Entomologist.

CONTRIBUTIONS TO THE VICTORIAN ENTOMOLOGIST

The Society welcomes contributions of articles, papers or notes pertaining to any aspect of entomology for publication in this Bulletin. Contributions are not restricted to members but are invited from all who have an interest. Material submitted should be responsible and original. The Editor reserves the right to have articles refereed. Statements and opinions expressed are the responsibility of the respective authors and do not necessarily reflect the policies of the Society.

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Contributions may *preferably* be E-mailed to Internet address: editor@entsocvic.org.au, or posted to the Hon. editor in *Microsoft Word for Windows* with an enclosed hard copy. Tables should fit an A5 page with 1 cm borders i.e. 12.5cm width x 18cm height as a maximum size and complex tables should be in .pdf format. Preference will be given to articles with 5 or fewer pages of solid text and articles longer than this will be returned to the author for reconsideration. The main text of the news bulletin is prepared in 8 point, *Book Antiqua* font (please do not use fixed point paragraph spacing). The deadline for each issue is the third Friday of each odd month.

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The *Victorian Entomologist* is printed at ImpactDigital

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DIARY OF COMING EVENTS

Saturday 7th December
Excursion to Jells Park
19:00 until late
Waverley Road Wheelers Hill Vic 3150
Details have been emailed to members

Tuesday 28th January, 2014
Council Meeting

Scientific names contained in this document are *not* intended for permanent scientific record, and are not published for the purposes of nomenclature within the meaning of the *International Code of Zoological Nomenclature*, Article 8(b). Contributions may be refereed, and authors alone are responsible for the views expressed.